

Shelve in Stacks S.B.T.

Highway Safety Literature

1-11
An Announcement
of Recent Acquisitions. . .

HSL No. 71-1

January 8, 1971



THIS ISSUE CONTAINS:

HS-008 347 - HS-008 379
HS-800 314 & HS-800 318

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HSL No. 71-1 January 8, 1971 HS-008 347 - HS-008 379, HS-800 314 & HS-800 318

HIGHWAY SAFETY LITERATURE

AN ANNOUNCEMENT OF RECENT ACQUISITIONS

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INTRODUCTION

Publications announced in *Highway Safety Literature* include the most recent additions to the collection of the NHSB Scientific & Technical Information Service. Subject areas covered include all phases of highway, motor vehicle, and traffic safety, especially those encompassed by the National Traffic and Motor Vehicle Safety Act of 1966 and the Highway Safety Act of 1966.

Individual issues of *HSL* are numbered according to the year and the issue number within that year; thus, 70 designates the year and 1, 2, 3, etc. the individual issues. To aid the user in locating citations by the HS-number, the cover bears the inclusive entry numbers for each issue.

Entries in *HSL* are arranged according to the revised NHSB Subject Category List shown in the Table of Contents. The List is a two-level arrangement consisting of five major subject fields subdivided into 58 subject groups. Documents related directly to the National Highway Safety

Bureau (NHSB) are announced in a separate section headed NHSB DOCUMENTS and are numbered in five distinct series: NHSB Accident Investigation Reports (HS-600 000 series), NHSB Compliance Test Reports (HS-610 000 series), NHSB Contractors Reports (HS-800 000 series), NHSB Staff Speeches, Papers, etc. (HS-810 000 series), and NHSB Imprints (HS-820 000 series). For NTIS DOCUMENTS in series HS-600 000 and HS-610 000, individual full case reports are available for inspection at the National Highway Safety Bureau; or for purchase from CFSTI (see page ii). Although announced together in a separate section, these documents are also assigned specific subject categories for machine retrieval.

A document which contains a number of separate articles is announced as a complete volume in the subject category most applicable to it as a whole. Entries for the individual articles appear in their most specific subject category.

SAMPLE ENTRIES

Subject Category Array _____

NHSB Accession no..... HS-800 218 Fld. 5/21; 5/9

Title of document..... AN INVESTIGATION OF USED CAR SAFETY STANDARDS-SAFETY INDEX: FINAL REPORT. VOL. 6 - APPENDICES G-L

Personal author(s)..... by E. N. Wells; J. P. Fitzmaurice; C. E. Guilliams; S. R. Kalin; P. D. Williams

Corporate author..... Operations Research, Inc., Silver Spring, Md., 015000

Collation _____

Publication date..... 12 Sep 1969 150p
Contract FH-11-6921
Report no. ORI-TR-553-Vol-6; PB-190 523

Abstract..... Appendices G-L to this study of used car safety standards include: indenture model diagrams for classes I-IV motor trucks; degradation, wear, and failure data for motor truck classes I-IV; and safety index tables for classes I-IV motor trucks.

Search terms: Wear /Trucks;
Failures /Trucks; Used cars; Inspection standards /Trucks; Inspection standards /Data

AVAILABILITY: NTIS

HS-004 497 Fld. 5/19

AUTO THEFT-THE PROBLEM AND THE CHALLENGE

by Thomas A. Williams, Sr.

Journal citation . . . Published in *FBI Law Enforcement Bulletin* v37 n12 p15-7 (Dec 1968)

Gives figures on the extent of the auto theft problem and comments on antitheft devices available now or in the planning stage.

Search terms: Theft, Theft protection, Stolen cars

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NOTE: () Numbers in parentheses following certain subject groups indicate the Highway Safety Program Standards (No. 1, and up) and/or Federal Motor Vehicle Safety Standards (No. 101 and up) which may apply to these groups.

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NOTE: Material published in Highway Safety Literature (HSL) is intended for the information and assistance of the motor vehicle and highway safety community. While brand names, equipment model names and identification, and companies may be mentioned from time to time, this data is included as an information service. Inclusion of this information in the HSL should not, under any circumstances, be construed as an endorsement or an approval by the Department of Transportation of any particular product, course, or equipment.

Harry A. Feinberg
Managing Editor

AVAILABILITY OF DOCUMENTS AND INSTRUCTIONS FOR ORDERING

Department of Transportation personnel may borrow copies of publications directly from the NHSB. Outside the Washington, D.C. area, phone (202) 426-2768. In Washington, D.C. area, use government ID, phone 118-62768. Non-DOT personnel should contact their company or agency libraries for assistance.

Journals cited may be obtained through most research libraries.

Contractors' reports and other documents can usually be obtained as indicated under AVAILABILITY. However, there is no certainty that retention copies will be available for more than a limited period after a document is issued.

The more common distribution sources are identified by symbols which are explained below:

NTIS: National Technical Information Service (formerly Clearinghouse for Federal Scientific and Technical Information-CFSTI), Springfield, Va. 22151. Order by accession number: *HS, AD, or PB*. Prepayment is required by NTIS (CFSTI) coupon (GPO coupons are not acceptable), check, or money order (made payable to the NTIS). *HC* (Paper copy; full size original or reduced

facsimile) \$3.00 up; *MF* (microfiche approximately 4x6" negative sheet film; reader required) \$0.95.

GPO: Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. Give corporate author, title, personal author, and report number. Prepayment is required by GPO coupon (NTIS [CFSTI] coupons are not acceptable), check or money order (made payable to the Superintendent of Documents).

HRB: Highway Research Board, National Academy of Sciences, 2101 Constitution Ave., N. W., Washington, D. C. 20418.

NHSB: National Highway Safety Bureau, General Services Division, Washington, D.C. 20591 (Telephone (202) 426-1585).

SAE: Society of Automotive Engineers, Dept. HSL, 2 Pennsylvania Plaza, New York, N.Y. 10001. Order by SAE report number. Prices given are list; discounts are available to members and sometimes to libraries and U.S. Government Agencies. Prepayment is required; orders without payment are subject to a \$1 handling charge.

IMPORTANT

WHEN REQUESTING a document, to be absolutely sure you receive what you order, give the accession number (HS, PB, AD number) or report number (in cases such as an SAE document), title of report, and the personal or corporate author (whichever is cited). When requesting an HS-numbered document from NTIS (CFSTI), add DOT/ to the prefix HS-; example HS-800 000 should be ordered as DOT/HS-800 000.

SPECIAL NOTICE

NEW PRICES FOR DOCUMENTS AVAILABLE FROM NTIS

On January 1, 1971, the National Technical Information Service (NTIS) increased the prices for documents in certain categories. These increases were made necessary by increased costs. Prices are now as follows:

PAPER COPY

Most documents announced after January 1, 1969, are priced:

1 to 300 pages	\$3.00
301 to 600 pages	6.00
601 to 900 pages	9.00
Over 900 pages	Exception Price

Two years after announcement, documents having 300 pages or less will have a service charge of \$3.00 added to the announced price. No service charge will be added for documents over 300 pages.

Documents announced prior to January 1, 1969, have a service charge of \$3.00 added to the announced price.

MICROFICHE

Microfiche reproduction of documents on a demand basis are priced at 95 cents per document.

Documents available on Standing Order through NTIS Selective Dissemination of Microfiche Service (SDM) are priced at 35 cents per document.

1/0 ACCIDENTS

1/1 Emergency Services

HS-008 347 Fld. 1/1

WHAT ARE YOUR CHANCES IN A MEDICAL EMERGENCY?

Charles Bonnie Remsberg

Published in *Good Housekeeping* v165 n5 (p100,265-66,271) (Nov 1967)

Many victims of auto and other accidents die needlessly or are disabled because of inadequate emergency medical services. It is estimated that one emergency case out of every three is mishandled in some way. The need for setting up and enforcing standards to control ambulance services is outlined. Some cases of gross negligence are described. Efforts made in some cities to improve the quality of emergency medical care are outlined.

Search terms: Emergency medical services; Ambulance laws; Emergency medical services /Negligence; Community support /Emergency medical services

1/3 Investigation and Records

HS-008 348 Fld. 1/3

SOME PHYSICS RELATED TO AUTOMOBILE ACCIDENTS

by George Barnes

Published in *Science Education* v51 n4 p358-68 (Oct 1967)

7 refs

The use of the principles of physics in reconstructing the circumstances of an accident is described. In almost every accident there is sufficient evidence through markings on the vehicles, pavement, and surrounding objects and through a knowledge of the initial directions and final resting points of the vehicles involved to permit a moderately detailed reconstruction. A discussion of how vehicle speed can be determined through skidding-stopping distances is included.

Search terms: Accident reconstruction /Physics; Accident reconstruction

tion /Evidence; Vehicle kinematics /Accident reconstruction; Vehicle trajectories /Accident reconstruction; Skidmarks /Accident reconstruction; Damage /Accident reconstruction; Speed /Stopping distances; Skidding /Stopping distances; Coefficient of friction /Stopping distances

2/0 HIGHWAY SAFETY

HS-008 349 Fld. 2/0; 4/4; 4/2

FEDERAL-STATE PARTNERSHIP IN HIGHWAY SAFETY: A REPORT ON THE NATIONAL HIGHWAY SAFETY ACT OF 1966

by Richard O. Jones

Published in *Traffic Quarterly* v24 n4 p591-607 (Oct 1970)

The history of the highway safety movement is outlined and the two 1966 safety laws discussed. Aspects discussed include the safety standards, the states' compliance with them, federal aid to the states, and the work of the National Highway Safety Bureau.

Search terms: Highway safety /History; Safety standards /Compliance; Highway safety /Federal aid; Highway safety /State planning; National Highway Safety Bureau; Highway Safety Act of 1966; National Traffic and Motor Vehicle Safety Act of 1966

HS-008 350 Fld. 2/0; 5/0

THE WAR AGAINST THE AUTOMOBILE

by Daniel P. Moynihan

Published in *Management Thinking* p22-23 (Oct 1966)

Reprinted from *The Public Interest* n3 (Spring 1966).

Traffic safety is a gigantic domestic problem, the dimensions of which are outlined. Aspects of the problem discussed are: reduction of accidents and injuries; venality of the automobile industry; the psychological role of the automobile; the failure of government to solve the problems; the lack of

standard statistics except for fatalities; the use of state police as the primary managers of traffic law enforcement; the role of the medical and legal professions and of federal regulation in finding solutions to the problem.

Search terms: Highway safety; Accident prevention; Injury prevention; Automotive industry; Automobiles /Psychological factors; Federal control /Automotive industry; Federal aid /Highway safety; Fatalities /Statistics; Accident data; Police /Traffic law enforcement; Police traffic services; Physicians /Highway safety; Lawyers /Highway safety

2/8 Police Traffic Services

HS-008 351 Fld. 2/8; 4/1

PURSUIT OF LAW VIOLATORS BY POLICE-LEGAL ASPECTS

by Lester A. Bonaguro

Published in *Traffic Digest and Review*, v17 n11 p21-4 (Nov 1969)

Problems arising from police chases are presented: duty of law enforcement officers; fleeing violators; authorization and right of way of emergency vehicles; civil liability and negligence of police officers. Court decisions and provisions in the Uniform Vehicle Code regarding pursuit of law violators by police also are included.

Search terms: Police chases /Legal factors; Police chases /Court decisions; Police chases /Negligence; Accident causes /Police chases; Police chases /Right of Way (Traffic rules); Uniform Vehicle Code /Police chases

2/9 Traffic Control

HS-008 352 Fld. 2/9; 4/7

CAR FOLLOWING AND ACCELERATION NOISE. CH. 2

by E. W. Montroll; R. B. Potts

Published in *Highway Research Board Special Report* n79 p37-48 (1964)

2/9 Traffic Control (Cont'd)

HS-008 352 (Cont'd)

8 refs

Three aspects of traffic theory are discussed: the movement of the isolated vehicle; the law of car following and variation of flow with density; and the acceleration noise of a vehicle in traffic. All are expressed mathematically.

Search terms: Car following /Mathematical models; Traffic flow /Mathematical models; Traffic density /Mathematical models; Acceleration/Traffic noises; Acceleration /Mathematical models

3/0 HUMAN FACTORS**3/1 Alcohol**

HS-008 353 Fld. 3/1

AN OPEN LETTER TO A DRUNK DRIVER TO THE CAR UP AHEAD

by Margaret M. Moore

Published in *Journal of Insurance Information* v26 n3 p25-7 (Mar-Apr 1965)

An insurance agent describes her experience in driving just behind a drunk driver for 30 minutes, during which he narrowly avoided head-on collisions 18 times. She suggests that such drivers are responsible for higher insurance rates, and that insurance companies might consider paying awards to those responsible for the arrest of drunk drivers.

Search terms: Driver intoxication / Head on collisions; Drinking drivers /Arrests; Insurance industry / Awards; Insurance rates

HS-008 354 Fld. 3/1; 3/4

PREVENTIVE ENFORCEMENT AGAINST DRUNK DRIVERS

by Ralph D. Scott

Published in *Traffic Digest and Review* v18 n10 pl-5 (Oct 1970)

The Arkansas State Police initiated a preventive enforcement program to keep drunk drivers out of automobiles. Laws regarding sale of liquor were enforced by obtaining the cooperation of tavern and club owners. Local authorities also cooperated in surveillance procedures, especially at night. Road blocks were found to be effective against drunk drivers. Arkansas has found its implied consent law useful. Because the revocation of driving licenses for drunk drivers is difficult to enforce, legislation to permit enforcement against the vehicle is being sought. Indications of success are taken from a traffic fatality reduction of 15% in 1969 as compared with 1968.

Search terms: Implied consent laws /Arkansas; Driver intoxication laws /Arkansas; Driver intoxication /Police traffic services; Driver license revocation /Driver intoxication; Fatalities /Arkansas; Driver intoxication laws /Enforcement

HS-008 355 Fld. 3/1; 3/5

HOW TO TEACH STUDENTS THE FACTS ABOUT DRINKING AND DRIVING

by Lee N. Hames

Published in *Traffic Safety* v70 n11 p8-13 (Nov 1970)

This brief for including information about drinking in the high school curriculum discusses Alcohol and blood levels, Alcohol content of specific beverages, and offers specific suggestions for student alcohol education.

Search terms: Alcoholic beverages /Education; Blood alcohol levels; Drinking drivers /High school driving courses; Curricula /Drinking drivers

3/4 Driver Behavior

HS-008 356 Fld. 3/4

BIG BROTHER AS DRIVER: NEW DEMANDS AND PROBLEMS FOR THE MAN AT THE WHEEL

by Thomas B. Sheridan

Published in *Human Factors* v12 n1 p95-101 (1970)

18 refs

This is a speculative exposition of human factors problems which may accompany semi-automation of highway vehicles. It emphasizes the problems of manual control takeover from an automatic system under both normal and emergency conditions. The paper hypothesizes a new way to consider driver alertness in terms of stability margins of control theory, proposes a three-time-scale model of driver decision-making, and suggests two simulation techniques especially applicable to studying driver alertness and manual control takeover.

Search terms: Automatic highways /Driver performance; Driver behavior /Attention lapses; Automatic highways /Warning systems; Driver behavior /Vigilance; Driving simulators /Automatic highways; Manual control /Automatic control

HS-008 357 Fld. 3/4

MUSCLE CARS—NEWEST THREAT TO TRAFFIC SAFETY?

by William Haddon, Jr.; Albert Benjamin Kelley

Published in *Journal of Traffic Safety Education* v18 n1 p7-8, 29 (Oct 1970)

It is suggested that cars whose looks, capabilities, and advertising appeal primarily to risk taking and adventurism have unhealthy implications for highway safety. Muscle cars have an increasing share of the automobile market and appeal almost exclusively to young drivers. The advertising of these cars emphasizes speed and thrills and contributes to the problems of violence in American life.

Search terms: High performance automobiles /Advertising; Risk taking /Young adult drivers; High performance automobiles /Young adult drivers; Violence /Young adult drivers; High speed /Young adult drivers

HS-008 358 Fld. 3/4

THE LONGEST RIDE IN YOUR LIFE

by Henry Gregor Felsen

Published in *Journal of American Insurance* v41 n1 p22-4 (Jan-Feb 1965)

The teen-age driver is discussed. Accident proneness, attitudes towards driving, and the responsibilities involved in being a licensed driver are outlined.

Search terms: Adolescent drivers / Driver attitudes; Adolescent drivers / Driver behavior; Adolescent drivers / Accident proneness

HS-008 359 Fld. 3/4

CYBERNETIC TELEVISION METHODS APPLIED TO FEEDBACK ANALYSIS OF AUTOMOBILE SAFETY

by Henry S. Kao; Karl U. Smith

Published in *Nature* v222 p299-300 (19 Apr 1969)

Cybernetic television techniques were used to investigate human factors in automobile steering and safety. Instead of seeing the road directly, the driver had to view a television monitor mounted in the windshield visor, on which the operational image of the passing road was transmitted from cameras located on the hood on the top of the car. This method is based on the theory that the driver steers the car by using points on the hood or front of the car in tracking. The purpose was to determine whether different loci of displaced vision from the frame of the car would provide significant differences in accuracy of driving. Results with 12 subjects confirmed the view that drivers steer with a locus of vision from the car top.

Search terms: Cybernetics / Steering; Television / Steering; Steering / Vision; Driver performance / Steering

HS-008 360 Fld. 3/4

MEASURING THE "SPARE MENTAL CAPACITY" OF CAR DRIVERS BY A SUBSIDIARY AUDITORY TASK

by I. D. Brown

Published in *Ergonomics* v5 n1 p247-50 (Jan 1962)

A fatigued driver who concentrates cannot be distinguished from a non-fatigued driver on the basis of controlling the car. A means of measuring the ability of the driver to make decisions over and above his ability to manipulate the controls is needed. A driver has greater capacity for dealing with information than is usually required in driving and can draw on his spare capacity in emergency. An attempt was made to measure this spare capacity by giving the driver a subsidiary auditory task to perform. The theory was that if a consistent performance level was maintained on the primary task, errors must occur on the subsidiary task when the demands of the two tasks exceeded capacity. The level of performance on the subsidiary task gives a measure of spare capacity.

Search terms: Driver fatigue / Decision making; Driving tasks / Hearing; Vehicle control / Driver fatigue; Driver behavior; Driver performance / Driver fatigue; Driver tests / Driver fatigue

HS-008 361 Fld. 3/4

ARE YOU A DEFENSIVE DRIVER?

Anonymous

Published in *Motorland* v91 n1 p8-9 (Jan 1970)

Pointers for defensive driving are presented

Search terms: Defensive driving

HS-008 362 Fld. 3/4

DRIVING ABILITY AS AFFECTED BY AGE. FINAL REPORT

by Harry W. Case; Slade Hulbert; Jinx Beers

California Univ., Los Angeles, Inst. of Transportation and Traffic Engineering, C21000

Mar 1970 175p 47 refs

Report no. PB-193 927; ITTE 70-18

Two groups of drivers designated as being "younger" or "older" dependent upon the age split at under or over 51 years, were tested in several performance and judgmental conditions, including the UCLA Driving Simula-

tion Laboratory. Various performance and judgmental scores were generated and analyzed in an attempt to relate such scores to chronological age. It was generally found that the judgmental skills of drivers do not decline with age (until senility), and that most older drivers make compensatory changes in their driving habits to coincide with known physiological deterioration. Further testing is recommended of the ability of older drivers to respond to forced pace subsidiary tasks while driving in the UCLA Simulator. As a screening device for driver licensing, the UCLA Sign Tester Device is recommended to discover those drivers, old or young, who cannot perform well on the double task of sign reading and vehicle steering.

Search terms: Age factors in driving; Driver license examination / Driving simulation; Instrumented vehicles / Age factors in driving; Age factors in driving / Physiology; Age factors in driving / Vision; Age factors in driving / Driver records; Age factors in driving / Speed; Age factors in driving / Statistical analysis; Age factors in driving / Visual perception; Age factors in driving / Judgment

3/5 Driver Education

HS-008 363 Fld. 3/5

EMERGENCY DRIVING--WHY TEACH IT? Pt. 2

by Arnold W. Siegel

Published in *Journal of Traffic Safety Education* v18 n1 p9-11 (Oct 1970)

Presented at the 18th Annual CALDEA Conference, Monte Corona Conference Center, Twin Peaks, California, March 21, 1970.

Inadequacies in driver education are discussed in relation with the following: skidding; mechanical failures; panic stops; braking; scene protection after vehicle breakdown or collision; interpreting signs; vehicle inspection; seat belts; and child seats. When emergency procedures are taught under the proper field conditions and when the above factors are included in the classroom curriculum, the student's chance

3/5 Driver Education (Cont'd)

HS-008 363 (Cont'd)

for survival are enhanced. Limitations of a basic program can be overcome by advanced training programs and by the extension of hours of field training. That a teacher must be properly prepared is emphasized.

Search terms: Driver education / Curricula; Behind the wheel instruction; Driver education /Instructors

3/11 Pedestrians

HS-008 364 Fld. 3/11

THE PEDESTRIAN AND TRAFFIC SAFETY

by Seymour E. Bergsman

Published in *Traffic Digest and Review* v18 n10 p12-6 (Oct 1970)

11 refs

Pedestrian safety problems are discussed. Most pedestrian fatalities take place in urban areas and often involve pedestrians who have been drinking, or who are either children or over age 65. The safety standard on pedestrians is a part of the highway safety program, and projects being conducted to implement this safety standard are discussed. Needs for additional programs are suggested.

Search terms: Pedestrian safety / Safety standards; Pedestrian fatalities /Urban areas; Pedestrian intoxication /Pedestrian fatalities; Pedestrian fatalities /Children; Pedestrian fatalities /Age factors; Highway safety /Pedestrian safety

4/0 OTHER SAFETY-RELATED AREAS**4/1 Codes and Laws**

HS-008 365 Fld. 4/1

THUMBS DOWN ON HITCHHIKING

Anonymous

Published in *Journal of American Insurance* v41 n3 p18-20 (May-Jun 1965)

Although hitchhiking is illegal in 41 states, the laws are almost never enforced. Motorists are urged never to pick up hitchhikers, many of whom have criminal records. Among the problems caused by hitchhikers are: involving the motorist in crimes; making motorists liable for them in case of accidents; and insurance problems.

Search terms: Hitchhiking /Legal factors; Law enforcement /Hitchhiking; Crime /Hitchhiking; Liability / Hitchhiking; Insurance /Hitchhiking

HS-008 366 Fld. 4/1; 5/20

TRUCK DRIVERS' CONTROL BOOK IN FRANCE--APPLICATION OF AN INTERNATIONAL DECISION

by Gustave Joubert

Published in *ILO Panorama* n22 p26-32 (Jan-Feb 1967)

The regulation of hours worked by truck drivers is difficult. The International Labor Organization designed a control book for this purpose. The use of this system in France is described.

Search terms: Work time standards /Truck drivers; Work time standards /Regulations; Truck drivers /France; Work time standards / France

5/0 VEHICLE SAFETY

HS-008 367 Fld. 5/0

DON'T DRIVE ON LUCK...MAKE THIS 13-POINT CHECK FOR A SAFE CAR

by Mort Schultz

Published in *Popular Mechanics*, v130 n4 p148-51,229 (Oct 1968)

Drivers are advised to check the following car parts as a safety precaution: windshield and related systems; rear-view mirror; lights; horn; tires; brakes; steering system; exhaust system; seat belts.

Search terms: Motor vehicle safety /Defective vehicles

5/2 Buses, School Buses, and Multipurpose Passenger Vehicles

HS-008 368 Fld. 5/2; 3/5

A BUSINESS GROWS: DRIVER TRAINING...DRIVER SUPERVISION...PREVENTIVE MAINTENANCE...AND SAFETY ASSURE SUCCESS!

Anonymous

Published in *School Bus Fleet* v15 n5 p24-7 (Oct-Nov 1970)

A privately owned school bus fleet is described. Drivers are trained and supervised. Preventive maintenance is scheduled. Supervisors attend national and state conventions, and workshops relating to school transportation. The company has served in consultant capacity to school districts. Performance of women as school bus drivers is discussed.

Search terms: School bus drivers / Driver education; School bus drivers /Females; School buses /Preventive maintenance; School buses / Safety programs

5/4 Design

HS-008 369 Fld. 5/4

SLED OR MODIFIED AUTOMOBILE RIDE. WHAM 2 ACCELERATOR TO PROVIDE CRASH RESEARCH DATA

by L.M. Patrick; Donald J. Van Kirk; Gerald W. Nyquist

Published in *SAE Journal* v77 n12 p43-51 (Dec 1969)

The Wayne horizontal accelerator mechanism (WHAM 2) is a versatile device for the study of human tolerance to impact and the characteristics of vehicle components under simulated crash impacts. It can be used with either a sled or a modified automobile on its own wheels, with accelerations or decelerations up to 60g being applied. Other crash variables include velocities up to 60 mph, onsets of 200-2000g/sec., acceleration distances up to 10 feet, and deceleration distances up to 6 feet. The same propulsion, snubber, and control systems are used for both sled and vehicle con-

figurations, with less than an hour between runs. Rapid installation of a vehicle or the sled in propulsion position allows maximum utilization of minimum time and cost.

Search terms: Impact sleds; Accident research/Impact tolerance; Instrumented vehicles/Impact tests; Deceleration/Impact tests; Acceleration/Impact tests; Velocity/Impact tests

HS-008 370 Fld. 5/4

HOOD SCOOP DESIGNS FOR CARS DERIVED FROM AERO RESEARCH

by George F. McCanless, Jr.

Published in *Automotive Engineering* v78 n9 p14-7 (Sep 1970)

Hood scoops substantially improve the performance of racing cars by capturing air and feeding it to the carburetors. Data from wind tunnel tests on airplanes provide guidelines for designing auto hood scoops. Primary benefits accrue at speeds above 100 mph, where there is a 1% gain, which rises rapidly with speed.

Search terms: Hood scoops/Racing automobiles; Air injection/Carburetors; High speed/Racing automobiles; Wind tunnels/Aircraft; Wind tunnels/Performance tests; High speed/Air injection

HS-008 371 Fld. 5/4

ARE CARS REALLY GETTING BETTER?

by Bill Kilpatrick

Published in *Popular Mechanics*, v129 n4 p80-3 (Apr 1968)

The average U. S. automobile today handles better, is more reliable, or offers improved creature comforts, has better tires than its five year old counterpart. Also, it is safer, which means industry money has been earmarked for the many features included in the average standard "safety package". Tests for economy, acceleration, panic braking are reported.

Search terms: Automobile design/Performance tests; Automobile design/Costs; Panic stops/Performance tests; Acceleration/Performance tests; Safety design/Automobile industry

HS-008 372 Fld. 5/4; 3/0

THE CHANGING CRITERIA FOR OPTIMIZING ENGINEERING DESIGNS

by Phillip S. Myers

Published in *SAE Journal*, v77 n12 p18-23 (Dec 1969)

The sociological, political, and humanistic changes taking place from now on may have more significance in determining what is or is not optimum design than do change in material, processes and technology. Effects of population growth, waste disposal, living standards, and availability of materials are discussed. The engineer himself may be required to alter his curriculum in the training period and may be required to become involved politically.

Search terms: Engineering curricula; Population/Engineering; Waste disposal/Engineering; Engineers/Social Sciences

5/6 Fuel Systems

HS-008 373 Fld. 5/6

EFFORTS CONTINUING FOR ELECTRIC AUTOS

by George A. Hoffman; Giovanni Caprioglio; Romeo R. Witherspoon; George A. Dalin

Published in *SAE Journal* v77 n12 p38-41 (Dec 1969)

Work on various battery operated vehicles proceeds towards some future break even point where progress in development may converge with harsher pollution control requirements to make the electric car competitive. An intermediate step is the hybrid power train concept which uses a combustion engine to drive a generator or alternator which in turn powers the batteries which drive the electric propulsion motors. Fused salt batteries are suggested as the best type for high energy density, long life, and low costs.

Search terms: Electric automobiles/Air pollution control; Hybrid powered vehicles; Fused salt batteries

HS-008 374 Fld. 5/6

HOW CARBON MONOXIDE AFFECTS YOUR DRIVING

by Stevenson Bacon

Published in *Popular Science* p72-5, 198 (Jan 1970)

Findings at a Marquette University study of carbon monoxide effects seem to indicate that eight hour exposure to 100 ppm of carbon monoxide produced no impairment of performance in tests of healthy, young volunteers. Thus it would seem that carbon monoxide should not constitute a serious hazard in normal driving since maximum levels in heavy traffic might be in the range of from 10 to 50 ppm. A Columbia University study also is described.

Search terms: Carbon monoxide/Driver performance

HS-008 375 Fld. 5/6; 5/4; 5/20

TURBO-CHARGED LP-GAS TRACTORS: POWER WITHOUT SMOKE

Anonymous

Published in *LP-GAS* v29 n5 p18-20 (May 1969)

At tractor pulling demonstrations, standard make liquefied petroleum gas farm tractors have outperformed gasoline and diesel rivals. In addition the LP tractors do not smoke. A turbo-charger has been developed which holds the rpm while raising the horsepower to a higher level. The turbo-charger also may be adapted for use in industry and for automobiles.

Search terms: Farm tractors/Liquefied petroleum gases; Farm tractors/Smoke; Turbochargers/Liquefied petroleum gases; Turbochargers/Power

5/11 Maintenance and Repairs

HS-008 376 Fld. 5/11

WHAT'S YOUR CAR'S FRAGILITY QUOTIENT?

Anonymous

Published in *Journal of American Insurance* v46 n5 p25-8 (Nov-Dec 1970)

and Repairs

Tests of many recent cars have shown their high damage costs. A table is provided showing the repair costs for various models at impacts from 5 to 15 mph. Damage quotients for new car models may be used as a basis for insurance rates. Legal and economic pressures may result in more crash-worthy cars, but the American consumer will be paying for fragile car designs for at least another decade. Proposed laws to require a minimum standard of crashworthiness are discussed.

Search terms: Repair industry; Crashworthiness /Repair costs; Crashworthiness /Damage costs; Automobile models /Crashworthiness; Impact tests /Automobile models; Impact tests /Damage costs; Impact tests /Repair costs

5/14 Occupant Protection

HS-008 377 Fld. 5/14

SEAT BELTS-THE PROPORTION OF CARS FITTED AND OF OCCUPANTS USING THEM

by B. N. Farr

England. Road Research Lab., Crowthorne, Berks., E14400

1970 17p

Report no. RRL-LR-342; PB-195 637

The proportion of front seat car occupants wearing seat belts and the proportion of cars fitted with front seat belts were studied in London and the Thames Valley during the summer months of the six year period 1964-1969. The proportion of all front seat car occupants wearing seat belts rose from 9% to 28% on Motorways, from 7% to 20% on "A" class roads, from 5% to 8% on town roads, from 2% to 8% in central London and from 3% to 5% in east London during the period covered. The proportion of cars fitted with front seat belts rose from 15% to about 70% during the same period. These results are supplemented by those of the Junior Acci-

dent Prevention Council of the Royal Society for the Prevention of Accidents which studied 8 regions of Great Britain during the summer of 1969. The survey suggested that regional differences may be less important than the type of road and type of journey.

Search terms: Seat belt use /London; Seat belt use /Great Britain; Seat belt use /Super highways; Seat belt use /Highways; Seat belt use /Streets; Seat belt use /Central business districts; Seat belt use /Summer

AVAILABILITY: NTIS

HS-008 378 Fld. 5/14

KEEPING CHILDREN SAFE

by Jill Tweedie

Published in *Robot* n50 p6-7 (Jun-Jul 1970)

Children should not be allowed to ride unrestrained in a car, and small children should not be held on adults' laps. Children should be trained from the beginning to ride in safety seats or be strapped into a child's safety belt.

Search terms: Safety seats /Children; Safety belts /Children; Restraint systems /Children; Occupant protection /Children

5/22 Wheel Systems

HS-008 379 Fld. 5/22

NEW TIRE TAKES THE DANGER OUT OF HIGH-SPEED BLOWOUTS

by John D. Kelley, William R. Woodall

Published in *SAE Journal* v77 n10 p60-3

Oct 1969

The radically different shape and construction of LXX tires allows the driver of a car to come to a safe stop in the event of a sudden flat, without major damage to the tire. If a special one piece rigid ring is inserted in the tire, it can be run flat at minimum interstate highway speed for as much as 80 miles. Other benefits include

cooler running, and lower cord and rim stresses.

Search terms: Rims /Safety design; Tire failures; Cantilever tires; Tire loads; Tire treads; Tire cords; Tire safety

AVAILABILITY: Corporate author

NHSB DOCUMENTS

NHSB Contractors Reports

HS-800 314 Fld. 3/2; 5/1

THE BRAKE PEDAL FORCE CAPABILITY OF ADULT FEMALES

by Richard W. Radlinski; James I. Price

National Bureau of Standards, Washington, D. C., N10200

Oct 1970 27p

Contract FH-11-6090

Report no. NBS-TN-557

A survey of the brake pedal force capability of 105 women was performed utilizing two stationary passenger automobiles as test vehicles. Results showed that over 50% of the test subjects could not achieve an average sustained brake pedal force of 200 pounds, a value which is considered an acceptable braking system input force under certain conditions of the current federal safety standard for braking system performance. Serious consideration should be given to reducing the 200 pound pedal force.

Search terms: Brake pedals /Pedal force; Pedal force /Female drivers; Brake systems /Safety standards; Pedal force /Safety standards

HS-800 318 Fld. 4/2; 4/1

COMMUNITY ACTION PROGRAM FOR TRAFFIC SAFETY. GUIDE II: LEGAL AUTHORITY

by Mel D. Powell; Michael K. Gemmell; Donald Murray; Warren P. Howe

National Assoc. of Counties Research Foundation, Washington, D. C., N06600

JANUARY 8, 1971

NHSB DOCUMENTS

Sep 1970 28p 44 refs
Contract FH-11-7091'

Legal authority available and needed to implement local traffic safety programs is discussed. Specific areas discussed are driver education; codes and laws; traffic courts; alcohol; traffic records; accident locations; emergency medical services; highway design, construction, and maintenance; traffic control devices; pedestrian safety; police traffic services; debris hazard control and cleanup. The most valuable tools for legal planning are the

Uniform Vehicle Code, the Manual on Uniform Traffic Control Devices, and the Model Traffic Ordinance.

Search terms: Traffic laws; Community support /Legal factors; Highway safety /Legal factors; Driver education /Legal factors; Traffic courts /Legal factors; Drinking drivers /Legal factors; Driver intoxication /Legal factors; Traffic records /Legal factors; Accident location /Legal factors; Emergency medical services /Legal factors; Highway design /Legal factors; Highway con-

struction /Legal factors; Highway maintenance /Legal factors; Traffic control devices /Legal factors; Pedestrian safety /Legal factors; Police traffic services /Legal factors; Debris removal /Legal factors; Hazards /Legal factors; Uniform Vehicle Code; Manual on Uniform Traffic Control Devices for Streets and Highways; Model Traffic Ordinance; Community support /Highway safety

AVAILABILITY: NHSB



executive summary

A SYNOPSIS OF A RECENTLY RELEASED NATIONAL HIGHWAY SAFETY BUREAU RESEARCH REPORT

AN INVESTIGATION OF FACTORS AFFECTING DRIVER ALERTNESS FINAL REPORT

The purpose of the project was to identify interactions of the vehicle, driver, and the road environment which tend to reduce driver alertness; to objectively measure these decrements in alertness; and, to delineate a program of research aimed at the development of countermeasures to reduce decrements in alertness.

Contract No. FH-11-7313
Cornell Aeronautical Lab., Inc.
4455 Genesee Street
Buffalo, New York 14221
DOT/HS-800 317
PB-195 920

Award Amount: \$55,737.00
Date Report Due: 8/20/70
Date Report Rec'd: 8/26/70
Release Date: 12/9/70

REPORT SUMMARY AND RECOMMENDATIONS

Summary

The project was divided into three phases; Phase I. Literature Review; Phase II, Experimentation; Phase III, Implications of the Research.

Phase I

- Phase I consisted of a review of the literature. In general it revealed most of the work touching on driver alertness has been concerned with basic input and output factors such as studies of decision making and vigilance. The review points out the need for more effort to be put into "real world" studies of driving as opposed to laboratory studies of factors hypothesized to be critical to driving. The review pointed out a number of areas which should receive more emphasis.
- Research is necessary into the nature and cause of variations in the driver's ability to process information with particular emphasis on the role of preattentive processing and selective attention. The review also identified a lack of research into the effect of motivation on driving performance. The Literature Review is included in the report.

Phase II

- The Experimental portion of the study was concerned with the effects of task complexity, acoustic noise level, and duration of trip on measures of alertness. In the interests of economy, precision, and safety, the study was conducted using the CAL driving simulator. The results of the study were as follows:

1. The driver's ability to maintain his vehicle on the road under nonalerting conditions decreases linearly with time over four hours.
2. The rate of steering wheel corrections made by the driver decreases linearly with time over four hours.
3. On a per subject basis, there is a significant negative correlation between position error and steering wheel correction frequency. This may be taken to indicate that either the subject perceptually samples his road position less frequently after driving a number of hours or he processes and reacts to his road position less frequently over long duration driving.

4. Measurements of position accuracy during a simulated emergency indicate that the driver is less likely to be able to control his vehicle accurately during an emergency after four hours of driving than after one hour of driving and that this decrease in control during the emergency is most severe when the driver has been exposed to a high level of acoustic noise.
5. Analysis of occipital EEG recordings reveal an increase in the occurrence of alpha bursts for all subjects.

Phase III

- Implications of the research were discussed. Included were considerations of modification to the road markings or road surface to reduce road position error and the analysis of control inputs to measure decreased alertness. The need for on-road validation of the study was discussed and a research plan for such validation outlined.

Recommendations

- In light of the findings of the Literature Review and of the experiment it would be imperative to validate the findings obtained in this study in an on-road study.

- It is important to recognize that the data are the product of laboratory experimentation and should be validated on the road using actual vehicles. The data represent changes of human performance in a highly sophisticated driving simulator. By definition, every simulation involves some lack of fidelity. In driving simulations in particular, the sensory environment is to some extent impoverished when compared to the real world. This impoverishment may yield more rapid deterioration of driving performance than can be expected in actual driving. Therefore, it may be that the same effects exhibited in the simulator study will occur in on-road driving but over a greater time scale. If the usefulness of the findings of the simulator study are to be maximized, attempts should be made to validate the findings and provide realistic time parameters for the effects recorded.

The Contract Manager has certified that the contractor's work has been satisfactorily completed and that all contractual obligations have been met.

The opinions, findings and conclusions expressed in this summary are those of the contractor and not necessarily those of the National Highway Safety Bureau.

Availability of Documents: NTIS (Formerly Clearinghouse), U.S. Department of Commerce, Springfield, Va. 22151.

U.S. DEPARTMENT OF TRANSPORTATION NATIONAL HIGHWAY SAFETY BUREAU

WASHINGTON, D.C. 20591

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